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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,255	10/31/2003	Martin Goedickemeier	DT-6658	2516
30377	7590	09/16/2005	EXAMINER	
DAVID TOREN, ESQ. ABELMAN FRAYNE & SCHWAB 666 THIRD AVENUE NEW YORK, NY 10017-5621			NGUYEN, GEORGE BINH MINH	
			ART UNIT	PAPER NUMBER
			3723	

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/699,255	GOEDICKEMEIER, MARTIN	
	Examiner	Art Unit	
	George Nguyen	3723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 9 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Receipt is acknowledged of Applicant's election filed on July 28, 2005.

Claims 9-10 were withdrawn from further consideration.

Claims 1-8 and 11-13 are presented for examination.

This application has been filed with formal drawings, which are acceptable to the examiner.

Election/Restrictions

1. Applicant's election without traverse of Group I invention of claims 1-8 and 11-13 in the reply filed on July 28, 2005 is acknowledged. Claims 9-10 were withdrawn from further consideration.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 1-8 and 11-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claim 1, the phrase "chordlike" renders the claim(s) indefinite because it is unclear what structure the claim(s), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 3723

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6, 8, 11, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hall'3,566,551.

With reference to Figures 1-2, cols. 1-3, Hall discloses the claimed invention including:

- an abrasive article in a tube 12 comprising abrasive particles 16 in a flexible bonding agent 18. In col. 2, lines 68-70, Hall discloses that the abrasive members are in the form of cord.

- in col. 3, lines 5-9, the disclosure of “cut to provide an abrasive surface” meets the limitation of “intended break zones” set forth in claim 2.

- in col. 2, lines 36-42, the disclosure of “plastic film” meets the limitation set forth in claim 13.

Please note that the preamble of “for a drilling tool ... with abrasive material” has been considered, but not given with any patentable weight due to its intended use.

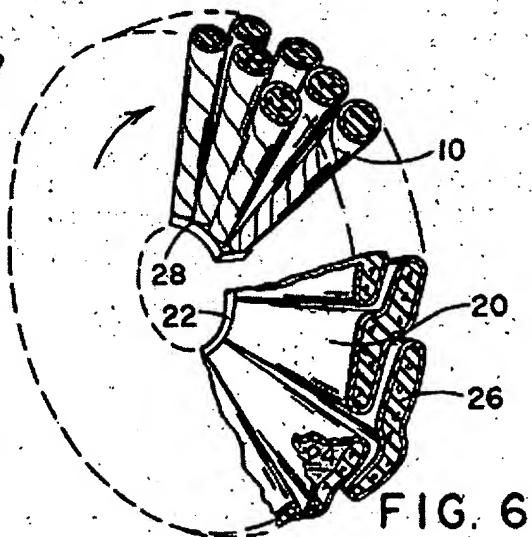
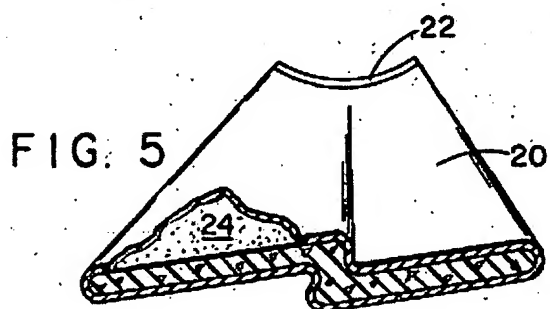
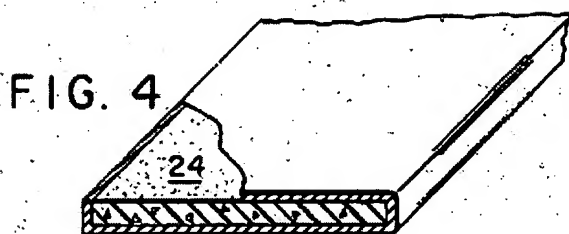
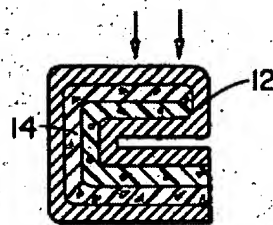
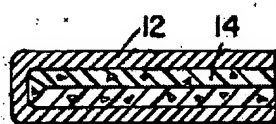
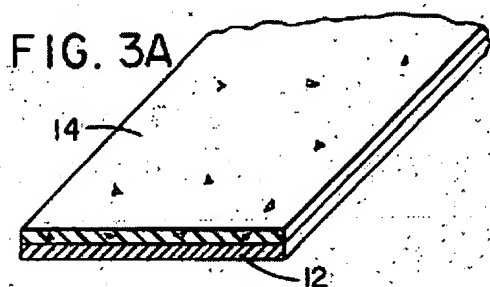
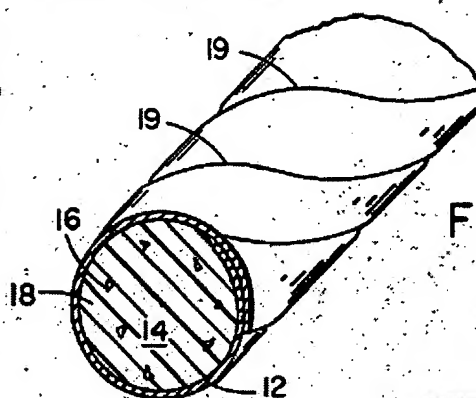
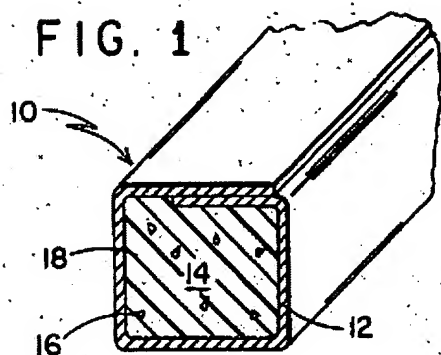
March 2, 1971

E. W. HALL, JR

3,566,551

SHAPED ABRASIVE

Filed Oct. 20, 1967



United States Patent Office

3,566,551

Patented Mar. 2, 1971

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3,566,551

SHAPED ABRASIVE

Elisha Winthrop Hall, Jr., Greenbush, Mass., assignor to
F. L. & J. C. Codman Company, Rockland, Mass.

Filed Oct. 20, 1967, Ser. No. 676,895

Int. Cl. B24d 9/02, 15/00

U.S. Cl. 51—336

13 Claims

ABSTRACT OF THE DISCLOSURE

An abrasive member comprising a shell of sheet or fibrous material intimately surrounding a filler of abrasive grains and a resilient bonding agent, the shell having one or more openings exposing the filler; the shell material shown is destructible with wearing down of the abrasive surface; shown also are the filler of polyurethane foams; twisting or tight folding for compressing the matrix prior to cure and to form strong cord like elements; wetting of the shell for adding moisture for the cure; and rotary abrasive members with radial elements formed by this technique.

This invention relates to abrasive members.

It is an object of this invention to provide a new abrasive member which is flexible, durable, resilient, capable of being formed into a number of desired shapes, and which has a continually self-renewing abrasive surface. Another object is to provide a new abrasive member which has the desirable characteristics of molded abrasives, including a substantial depth of abrasive and predetermined dimensional properties, and yet is capable of being easily and economically manufactured in a continuous manner without the costly and time-consuming use of molds. It is another object to provide an improved grinding or buffing member which employs protruding elements.

The invention features an abrasive member comprising a shell formed of sheet or fibrous material intimately surrounding an abrasive filler comprising abrasive grains and a resilient bonding agent, the shell having at least one opening exposing the filler. In preferred embodiments, the shell is a tube having at least one open end; the shell is of relatively flexible material which is also destructible with wearing down of the abrasive filler to provide a continuously regenerated open abrasive surface, and advantageously in certain instances the material is formed of fibers such as paper or cloth, is porous, or is heat-resistant; the filler comprises a resilient bonding material, such as polyurethane foam having abrasive grains substantially uniformly dispersed throughout and bonded to it by the bonding agent; and the shell comprises a long twisted or tightly folded tube.

The invention features a rotary abrasive member comprised of a number of elements formed as above, the elements secured to a center and protruding radially exposing their sides or peripheral surfaces for abrasive action.

The invention also features a method of continuously forming an abrasive product comprising a shell of sheet or fibrous material surrounding a filler comprising abrasive grains and a resilient bonding agent, comprising the steps of providing a long strip of thin shell-forming material, spreading on the strip a strip of an abrasive mixture comprising a uniform dispersion of abrasive grains and a resilient bonding agent, conforming the shell-forming strip around the abrasive mixture to form a continuous shell compressed together with the abrasive mixture, and subjecting the abrasive mixture and shell to curing conditions to cure the resilient bonding agent.

In preferred embodiments the bonding agent is of the

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essary moisture; the abrasive mixture includes a foamable material which foams in situ after formation of the shell, to create a compressive condition therewithin; the filler includes a mixture of preformed foam particles and abrasive grains adhered thereto; and after the shell surrounds the filler, it is compressed more tightly by twisting, folding, or compression with rollers.

Other objects, features and advantages will appear from the following description of a preferred embodiment of the invention, taken together with the attached drawings thereof, in which:

FIG. 1 is a perspective view of a preferred embodiment of the present invention; and,

FIG. 2 is a perspective view of another preferred embodiment; and,

FIGS. 3a, b and c illustrate successive steps in the manufacture of a multi-folded abrasive element according to the invention;

FIG. 4 illustrates a slab form of abrasive element;

FIG. 5 illustrates a pleated slab form of abrasive element;

FIG. 6 diagrammatically illustrates abrasive members employing the abrasive elements of FIGS. 2 and 5.

FIG. 7 is a diagrammatic view of a preferred method of making an abrasive member embodying the present invention.

In FIG. 1 is shown an abrasive element 10 comprising a folded-over shell 12 enclosing a filler 14 containing abrasive grains 16 in a flexible bonding agent 18. In FIG. 2, the element of FIG. 1 has been provided with a number of twists 20 prior to curing of the bonding agent. These twists advantageously may apply pressure to the filler, stabilize the dimensions of the element, add reinforcement, and ensure a more compact and strong product.

In the embodiment shown, the shell is formed of paper. However, other fibrous material, such as cloth, woven fiberglass, etc., or plastic film such as fluoro carbon film (e.g., "Teflon") or polyester ("Mylar") may be used, depending on the strength, flexibility and work ability desired in the finished abrasive member.

Among the preferred bonding agents are the elastomeric polyurethanes (prepared, e.g. by reacting aryl diisocyanate with polyols selected from diols and high molecular weight triols). Abrasive grains 16 are preferably in the size of about 30 to 220 grit or finer, and may be of any of a number of materials (e.g., silicon, carbide, aluminum oxide) having preselected cutting characteristics, to perform grinding, buffing or polishing.

In a preferred embodiment, filler 14 also contains foam material, preferably a polyurethane foam.

In certain instances, as when the abrasive element has a small cross-section, the urethane material in non-foamed state with abrasive grains dispersed therein is introduced to the shell, and thereafter the material foams in situ and may be cured by application of heat, moisture or catalyst through the shell, causing the material to intimately contact the shell. Preferably the foaming creates pressure which serves to limit the degree of foaming, and achieve intimate bonding of shell to filler.

In other instances, to assure a uniform dispersion of abrasive grains in foam material, abrasive grains and bonding agent are mixed with a large number of discrete pre-formed resilient urethane foam members (see co-pending United States Application, Hall et al., Ser. No. 456,647, filed May 18, 1965). The foam is compressed, e.g., by twisting, in the abrasive member prior to curing.

Although in the embodiments shown, the abrasive members are in the form of cord, it will be understood that many other shapes are also encompassed by the pre-

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall'3,566,551.

Hall has been discussed above, but does not disclose the thickness range as set forth in the claim.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the range set forth in the claim since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Conclusion

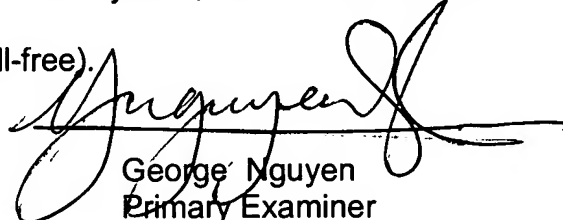
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Murai et al.'4,866,888 discloses wire incrusting with abrasive grains. Faas'6,508,698 discloses grinding or cleaning device for a textile machine. Englund'2,413,551, Buell'2,398,408, and Sharpe'2,383,519 all disclose cylindrical abrasive article.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Nguyen whose telephone number is 571-272-4491. The examiner can normally be reached on Monday-Friday/630AM-300PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail can be reached on 571-272-4485. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George Nguyen
Primary Examiner



George Nguyen
Primary Examiner
Art Unit 3723

GN – September 14, 2005